UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/784,800	02/15/2001	Joseph S. Gordon	064441.0207	2724

31625 7590 05/30/2006

BAKER BOTTS L.L.P.
PATENT DEPARTMENT
98 SAN JACINTO BLVD., SUITE 1500
AUSTIN, TX 78701-4039

EXAMINER	
CHANG, AUDREY Y	
ART UNIT	**PAPER NUMBER**
2872	

DATE MAILED: 05/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

H:A

Office Action Summary	Application No.	Applicant(s)	
	09/784,800	GORDON ET AL.	
	Examiner	Art Unit	
	Audrey Y. Chang	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 March 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *7,9-14,16-24 and 26-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7,9-14,16-24 and 26-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Remark

- This Office Action is in response to applicant's response filed on March 28, 2006 which has been entered into file.
- No amendment to the claims have been filed with the response.
- Claims 7-14, 16-24, and 26-30 remain pending in this application.

Response to Amendment

1. The amendment filed on **February 9, 2005** is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

The phrase "light is transmitted ... through the opening through the thin film and onto the wafer ..." recited in **amended claims 7, 17 and 26**, the phrase "*wherein a portion of the transmitted (or projected) light is diffracted by the photomask opening and passes through the thin film at the angle of incidence greater than zero, the transmission of such portion of light passing through the thin film at the angle of incidence greater than zero being maximize due to the optical thickness of the thin film produces an increased resolution of the projected image on the wafer*" recited in **amended claims 7 and 26.**, and the phrase "*light transmitted ... through opening in the photomask through the thin film onto the wafer ... a portion of the transmitted light is diffracted by the photomask opening and passes through the thin film as off-axis light the approximate 99% transmission of such off-axis light produces an increased resolution of the image of the opening projected onto the wafer*" recited in **amended claim 17.**

The specification **fails** to teach that the transmitted light passes through the photomask, then through the thin film and then to the wafer, and **fails** to teach the light diffracted by the photomask or the

projected image generated from the photomask will pass the thin film again and a *diffracted portion* of the light passes through at an incident angle greater than zero is *maximized* due to the optical thickness of the thin film. The specification also **fails** to positive support for the diffracted light from the photomask passes through the thin film as off-axis light and 99% of the off-axis light increase the resolution of the image. The specification explicitly teaches that the pellicle film is *on* the photomask wherein the light will incident on the *pellicle* first before it been diffracted by the photomask as demonstrated by Figure 3 of the instant application.

The applicant is respectfully noted, although the specification loosely discloses that the pellicle may be placed between the photomask and an imaging lens, (specification page 10 lines 15-17), this phrase does not give the support for "*wherein a portion of the transmitted (or projected) light is diffracted by the photomask opening and passes through the thin film at the angle of incidence greater than zero, the transmission of such portion of light passing through the thin film at the angle of incidence greater than zero being maximize due to the optical thickness of the thin film produces an increased resolution of the projected image on the wafer*" and/or "*light transmitted ... through opening in the photomask through the thin film onto the wafer ... a portion of the transmitted light is diffracted by the photomask opening and passes through the thin film as off-axis light the approximate 99% transmission of such off-axis light produces an increased resolution of the image of the opening projected onto the wafer*" as claimed in the claims.

Since the specification fails to give an explicitly relationship between the pellicle, the photomask, the imaging lens and the wafer. And the specification fails to teach that the thickness of the pellicle is designed to maximized the diffracted light from the photomask toward the wafer. A simple language of placing the pellicle between the photomask and the imaging lens (without explicitly states the location of the imaging lens to the least) WILL NOT be enough to support the "maximization of diffracted light portion from the photomask trough the pellicle to the wafer" or

"99% of the transmission of the off-axis light produces an increased resolution of image". The imaging lens is not even in the claims and is not disclosed in the specification either. The applicant is respectfully noted that the lens (47, Figure 1) in the cited Nose patent can be regarded as "imaging lens" for the pellicle to be placed between the photomask and the imaging lens. Furthermore, the applicant is also respectfully noted that in the same paragraph of the specification (page 10) there is an explicitly teaching of having the pellicle "covers" the photomask for protecting it from dust. If one reads the paragraph in page 10 of the specification with the explicitly disclosure of the pellicle being formed on the photomask as shown in Figure 3, one would not be able to deduce that the diffracted light from the photomask is capable of being transmitted through the pellicle and the non-zero incident of the diffracted light on the pellicle will be maximized and the light diffracted from the photomask will be off-axis light passes through the pellicle with 99% of the off-axis light increases the resolution of image".

Furthermore, since the pellicle has only specific transmission peaks at specific wavelength and specific angles of incidence, to simply placing the pellicle between the photomask and the imaging lens will not be able to meet the sophisticated condition to produce the maximum off-axis transmission for the diffracted light as claimed in the claims.

There simply are not enough explicit disclosures and supports for the claim languages of claims 7, 17 and 26.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. **Claims 7, 9-14, 16-24 and 26-30 are rejected under 35 U.S.C. 112, first paragraph**, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The reasons for rejection based on *newly added matters* are set forth in the paragraph above.

4. **Claims 7, 9-14, 16, 17-24 and 26-30 are rejected under 35 U.S.C. 112, first paragraph**, as containing subject matter which was not described in the specification in such a way as to **enable** one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The phrase "the transmission of such portion of light ... produce an *increased resolution* of the projected image on the wafer" recited in claim 7 and **the** phrase "projection of the diffracted portion of light ... *increase* the *resolution* of the image" recited in claim 26 are not enabled by the disclosure since the *resolution* of the projected image is determined by **the Rayleigh's criterion,** namely if the angular separation between two image points are greater than 1.22(L/d), with L being the wavelength and d being the **size** of the **opening** the two points can be resolved. The *resolution* of a projected image therefore is **implicitly** defined at least in part by the *size* or spatial information of the *opening* of the *photomask*, but not by the projection of certain portion of the light. To the most the projection of the light will only increase the *intensity* of the image but not the resolution.

The phrase "wherein a portion of the transmitted (or projected) light is diffracted by the photomask opening and passes through the thin film at the angle of incidence" recited in **claims 7 and 26** and the phrase "light transmitted ... through opening in the photomask through the thin film onto the wafer ... a portion of the transmitted light is diffracted by the photomask opening and passes through the thin film" recited in **claim 17** are not enable by the disclosure of the structure of the pellicle with the

frame in associated with the photomask as shown in Figure 3. In this structure, the light passes through the thin film first then to the photomask. The light diffracted by the photomask **will not** pass through the thin film again rather the diffracted light will proceed to the wafer so that the image information of the photomask can be formed on the wafer. **The specification and the claims therefore fails** to teach how to form such pellicle with the frame and thin film with respect to photomask to enable the claimed light passages.

Claim 17 recites that the "amorphous fluoropolymer thin film operable to transmit approximately ninety-nine percent (99%) of off-axis light at a particular wavelength", however the specification fails to disclose such. The specification **only** enables the off-axis light at *certain degrees of incidence* to have transmission approximates 99% of the light but not to all of the off-axis lights or not to any off-axis light at *any* incident angle.

Claims 9-14, 16, 18-25 and 27-30 inherit the rejections from their respective based claim.

Claim Objections

5. Claims 9, 12, 19, 21 and 29 are objected to because of the following informalities:

(1). It is not understandable how could the thin film having thickness that gives peak transmission for **off axis** or **non-normal incident light** but is able to give peak transmission for wavelength that is *1 nanometer* above the "particular wavelength". It is impossible to have this kind of accuracy for light having wavelength differing only in one nanometer to give so different transmission property.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 7-14, 16-24 and 26-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Nose et al (PN. 5,742,386) in view of the patents issued to Hayano et al (PN. 4, 966,457) and Fukumitsu et al (PN. 4,657,805).

Nose et al teaches an *exposure system* for detecting foreign matter AND exposing information on the photomask on photosensitive material coated on a wafer, (please see column 8, lines 1-7), that is comprised of a *pellicle* (50) having a *thin film*, fixed to a *pellicle frame* (51), made of *aluminum*, in order to cover a *pattern* portion on a *photomask* (52), (please see Figures 1, 6 and 9, column 1, lines 44-54 and column 4). Nose et al teaches that the pellicle with the thin film, having certain optical thickness, is capable of making the peaks of transmission of the light with incident angles at ***off axis*** (such as 10^0, 30^0, 60^0 as shown in Figure 7) to be at *100 percent, (please see the 100 percent transmission of the off-axis light in Figures 7 and 8)*. This pellicle with thin film therefore is capable of *maximizing* the transmission of light at **off axis** at an exposure wavelength, which serves as the particular wavelength.

With regard to the feature such that the *optical thickness* of the pellicle film operable to maximize transmission of an exposure wavelength at an angle of incidence greater than zero, and the thickness being equal to *one-quarter or less than one quarter of the exposure (or the particular) wavelength* plus a design thickness for the design thickness being the thickness of the film allows to produce a transmission peak for normal incidence.

Nose et al teaches that the pellicle film, with definite thickness, enables the incident light with exposure wavelength to achieve transmittance peaks (100 percent transmittance) for incident angle *greater than zero*, (please see Figures 7 and 8). Nose et al further teaches that by varying the optical thickness of the pellicle film the maximized transmittance of the light of an exposure wavelength can be

achieved at **different** incident angles greater than zero as shown in Figure 7. Although this reference does not teach **explicitly** that the film thickness is equal to one-quarter or less than one quarter of the exposure wavelength plus a design thickness for the design thickness being the thickness of the film allows to produce a transmission peak for normal incidence, but such feature is **implicitly** met for the reasons state as follows. It is known in the art that the maximum transmittance of the pellicle film for normal incident is determined by the equation: $m * \lambda = (2 * n) * d$, with m being an integer, λ being the exposure wavelength, n being the refractive index of the pellicle film and d being the thickness of the film. It can be easily calculated that for n =1.5 and the exposure wavelength being 0.488 μm the design thickness d for normal incidence is 0.813 μm, which means the actual thickness 0.86 μm is being greater than the design thickness by less than one quarter of the exposure wavelength, (one quarter of the exposure wavelength is 0.122 μm). **One skilled in the art** would understand that the maximum or peak transmission of the light is determined by the *interference theory*. By teaching the peak transmission occurs at incident angle *greater than zero or non-normal incident angle*, according to the interference theory, the thickness of the film taught by **Nose** et al **must be different** from the thickness of the film that gives peak transmission at normal incident angle. In order for the peak transmission, (for non-normal incident angle) to be **at** the **same exposure wavelength** as for normal incident, the thickness of the film has to be varied from the thickness for normal incident. It is a simple mathematical calculation and one skilled in the art would understand such.

With regard to the amended features of "the thin film formed to cooperate with a photomask including an *opening* such that when light is transmitted at the particular wavelength *through* the opening in the *photomask*, *through* the thin film *onto* the wafer to project an image of the photomap opening onto the wafer" is completely wrong and not supported by the specification. This feature, namely, the order of the light therefore cannot be further examined here since it is in contradiction to the lithographic process.

With regard to the features concerning the *lithographic process* of forming the opening of the photomask onto a wafer, Nose et al teaches that the pellicle (50) is formed to *cooperate* with a *photomask* (52) as shown in Figures 1 and 3). Nose et al further teaches the *photomask with the protective pellicle* is used in *a semiconductor device* ***manufacturing*** *apparatus*, or lithographic exposure apparatus, (please see Figure 9) wherein the image information, such as **IC pattern**, (please see column 1, line 49 and column 2, line 24, the explicitly teaching of IC pattern on the photomask) or **reticle pattern** (108, Figure 9) **placed** in the photomask is **transferred** onto a *wafer* (1110). It is **implicitly** true that the photomask has "opening" and has spatial information, i.e. physical pattern, that is *transferred* to the wafer to manufacture the semiconductor device, (please see Figure 9, column 1 lines 13-21 and column 7, lines 7-31). The IC or integrated circuit pattern MUST have openings otherwise no electric circuit will be created. Also by nature of the "photomask", a photomask MUST have an opening otherwise no light will be passing through the photomask and no image can be projected onto the wafer. The opening associated with the IC pattern or the reticle pattern on the photomask cooperates to produce and define the image of the pattern being formed on the wafer and **according to the Rayleigh's criterion which means the opening in the photomask will diffract the light beam**, (explained in paragraph above) the size of the opening **implicitly** determines at least partially the resolution of the projected image. Nose et al teaches explicitly that the apparatus is not just for inspecting foreign matters in the photomask *but it is* also and *ultimately* a lithographic exposure means for forming IC pattern on the wafer, (please see the explicitly teachings in column 3, lines 25-30, Figure 11, column 8, lines 1-7). In Figures 7 and 8, Nose et al teaches explicitly that the *thin film* will cause the incident light to have maximized transmission at certain off-axis incident angles, it is therefore either implicitly true or obvious modification to one skilled in the art to use light incident at these off-axis incident angles on the thin film pellicle and the light is transmitted by the thin film to the photomask and to expose and transfer the IC pattern on the photomask to the wafer for the benefit of maximizing the intensity of the exposure light to efficiently form the pattern on the wafer.

With regard to the features concerning "*light transmitted through opening in photomask through thin film and onto the wafer ... wherein a portion of the transmitted light is diffracted by the photomask opening and passes through the thin film at the angle incidence greater that zero being maximized due to the optical thickness of the thin film produces an increased resolution of the projected image*" as recited in **claims 7 and 26,** and the features "*light transmitted ... through opening in the photomask through the thin film onto the wafer ... a portion of the transmitted light is diffracted by the photomask opening and passes through the thin film as off-axis light the approximate 99% transmission of such off-axis light produces an increased resolution of the image of the opening projected onto the wafer*" **as recited in claim 17**, they are rejected under 35 USC 112, first paragraph, for the reasons stated above. **Nose** teaches that the pellicle having the pellicle thin film coupled to a frame can be designed to cover the photomask from both sides of the photomask, (please see Figures 1 and 9). However it does not teach explicitly that the thin film (50) is placed on both sides of the photomask. **Hayano** et al in the same field of endeavor teaches a pellicle for protecting a photomask wherein the pellicle thin film has maximum transmission peaks for light incident at angles greater than zero, (please see Figures 1 and 2) wherein the pellicle thin films (1 and 1a) can be formed with a frame such that the pellicle thin film is placed at **both** sides of the photomask (3, please see column 7, lines 44-49). It would then have been obvious to one skilled in the art to apply the teachings of **Hayano** et al to modify the pellicle of **Nose** to make the pellicle thin films at both sides of photomask to enclose the photomask to provide better protection of it from dust an to enhance the light transmitted from photomask as desired. It is implicitly true by having the pellicle thin film placed at the lower surface of the photomask, the light diffracted by the photomask will then pass through the pellicle thin film.

With regard to the features concerning the thin film produces a peak in transmission for normal incidence at a wavelength between one nanometer to twenty nanometer above the particular wavelength, this feature is implicitly met by the interference condition of the thin film since for the thickness of 0.86

micron the maximum peak occurs for light of 488 nm wavelength at 10 degrees of incident light, then for the same thickness of the thin film, the maximum peak of transmission for normal incident will occur of light having wavelength close to 484 nm which is within the range.

This reference has met all the limitations of the claims with the exception that it does not teach *explicitly* that the pellicle film is an amorphous fluoropolymers. **Fukumitsu** et al in the same field of endeavor teaches a thin film pellicle for a photomask wherein the thin film is made of amorphous fluoropolymers that has a good transmittance in the ultraviolet and visible wavelength ranges, (please see the abstract). It would then have been obvious to one skilled in the art to apply the teachings of Fukumitsu et al to make the thin film pellicle of Nose et al with amorphous fluoropolymers for the benefit of using a suitable material that has good transmittance property to make the pellicle. Furthermore, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended used as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

With regard to claims 10-14, 20-24 and 27-30, the Nose et al reference does not teach explicitly to include anti-reflective coatings on the pellicle. **Fukumitsu** et al in the same field of endeavor teaches a dust cover for photomask reticle wherein the dust cover comprises a thin film (1) and an anti-reflective coating (3) on the top and bottom surfaces of the thin film, (please see Figures 1 and 2). Fukumitsu et al teaches that the anti-reflective coating has a thickness of about one quarter of the design wavelength and has a refractive index that is a square root of the refractive index of the thin film (1), which is therefore different from the refractive index of the thin film, (please see column 5, lines 8-50). It would then have been obvious to one skilled in the art to apply the teachings of Fukumitsu et al to add anti-reflective coating on top and bottom of the thin film pellicle of Nose et al for the benefit of improving the transmittance and reduced the unwanted reflection of light from the pellicle.

With regard to claim 16, Nose et al teaches that the thickness of the thin film is about 0.86μm, or 860 nanometers and Nose et al teaches that the exposure wavelength is about 0.488μm or 488 nanometer,

(please see Figure 7), but it does not teach explicitly that the exposure wavelength is between the 248 and 436 nm. However the specification fails to teach the criticality of having these particular wavelengths would overcome any problem in the prior art and since Nose et al teaches that by changing the thickness of the thin film the peaks of the transmission may be changed, it is therefore obvious modifications to one skilled in the art to design the pellicle thin film to have the desired peaks to facilitate different exposure wavelengths for the benefits of utilizing it in optical systems operated with different wavelength sources as desired.

Response to Arguments

8. Applicant's arguments filed March 28, 2006 have been fully considered but they are not persuasive. The newly amended claims have been fully considered and they are rejected fro the reasons stated above.

9. In response to applicant's arguments which state that "hence these portions of the specification **read together with the claims** renders it clear to the reader that light is capable of being incident upon the photomask prior to being diffracted onto the pellicle" the examiner respectfully disagrees for the following reasons.

(1). Out of all the citations of **different** portions of the specification, the applicant **fails** to provide just one single paragraph which **explicitly** states "light is transmitted at the particular wavelength through opening in the photomask, through the thin film and onto wafer to project an image of the photomask opening onto the wafer, wherein a portion of the transmitted light is diffracted by the photomask opening and passes through the thin film at the angle of incidence greater than zero" as recited in claims 7, and 17 or "projecting the radiant energy through opening in the photomask, through the thin film and onto wafer to from an image of the photomask opening on the wafer, wherein a portion of the projected light is diffracted by the photomask

opening and passes through the thin film at the angle of incidence greater than zero" as recited in claim 26. The piece meals presentation fails to provide the explicit features recited in the claims. **Applicant's own admission that the specification needs to "read together with the claims" to make these features explicitly** is an admission that the specification simply fails to give such explicitly teachings, since the portions of the claims that the applicant referred to **are added new matters themselves. In particularly, the specification fails to give explicit teachings of the light being diffracted by the photomask and incident on the pellicle at an angle greater than zero.**

(2). The phrase "coupled to a photomask" does not give support for "**the light being diffracted by the photomask and incident on the pellicle at an angle greater than zero".** Page 10, lines 15-17 states that the pellicle is "placed between the light source and the photomask, or between the photomask and the imaging lens, or both" that also **does not** give explicit support for "**the light being diffracted by the photomask and incident on the pellicle at an angle greater than zero". Since in this paragraph**, there is no structural relationship between the light source, the pellicle, the imaging lens and the photomask, it is impossible to definitely determine that the pellicle is placed after the photomask, since both the imaging lens and the pellicle can be placed before the photomask to satisfy the description here. Even if the pellicle is placed after the photomask, which totally defeats the purpose of using pellicle to **cover** photomask for protecting it, this phrase **STILL DOES NOT** disclose "**the light being diffracted by the photomask and incident on the pellicle at an angle greater than zero".**

(3). Applicant's arguments based on Figures 2A, 2B and 3 do not give explicit support for the new matters features either. Figure 3 EXPLICILT teaches that the light **diffracted** by photomask CANNOT passes through the pellicle since the pellicle is placed before the photomask. Figures 2A and 2B do not show the pellicle at all.

(4). The recitation of Page 13 lines 11-23 of the specification FAILS to definite state that the pellicle is placed after the photomask since the imaging lens is not specifically defined in this case. Furthermore, this paragraph FAILS to explicitly state **"the light being diffracted by the photomask and incident on the pellicle at an angle greater than zero".**

(5). Applicant being one skilled in the art must understand that simply placing the pellicle after the photomask does not imply that **"the light being diffracted by the photomask and incident on the pellicle at an angle greater than zero".**

The new matters rejections therefore STILL HOLDS, since the specification simply FAILS to disclose the explicit teachings of the claims.

10. In response to applicant's arguments concerning the rejections under 35 USC 112 concerning the increasing of the resolution, the applicant STILL FAILS to teach how could the resolution be increased.

11. In response to applicant's challenge of examiner's authority in objecting claims 9, 12, 19, 21 and 29 for the accuracy and even possibility of claimed subject maters, the applicant is respectfully noted that 35 USC 101, and 112 gives the examiner authority to question the enablement of the claimed subject matters. The examiner will also provide the physical reason arguments for challenging the enablement of claims 9, 12, 19, 21 and 29.

If the design optical thickness (T) for making light having the particular wavelength (λ) to have maximum transmission at normal incidence, then the following equation should hold:

$T = (M/2)(\lambda)$ for M being an integer,

The actual optical thickness (T') of the film from claim 7 then should be

$T' = T + (1/4)(\lambda)$,

In order for the light to have a wavelength within 1 nanometer to 20 nanometer to have a peak or maximum transmission at normal incidence the following equation should hold:

T' = (K/2) (λ + 1 or 20 nm) = T + (1/4) (λ) = (M/2) λ + (1/4) (λ) = (M/2+1/4) λ, K being an integer, or

(K/2) (λ + 1 or 20 nm) = (M/2+1/4) λ,

For λ being 248 nm for instance, the equation becomes

(K/2) (249) = (M/2+1/4) (248) or (K/2) (268) = (M/2 +1/4) (248)

Or K= 0.99(M+1/2) or K= 0.92 (M+1/2)

It is **impossible** to find an integer "K" that will satisfy these equations when M is an integer too. That is to say it is impossible to make the light having a wavelength within 1 to 20 nm of the particular wavelength to have a peak of transmission for *normal incident* for the pellicle having the optical thickness as required by claim 1.

12. In response to applicant's arguments concerning the cited references, the applicant is respectfully reminded that the features that relied upon are not supported by the specification and therefore cannot be relied upon to overcome the rejection. Furthermore, Hayano et al teaches explicitly that the pellicle can be placed after the photomask, this mean by the same token of applicant's arguments, the light diffracted by the photomask then will incident on the pellicle at an angle greater than zero and the off-axis transmission can be greater than 99% as shown in Figure 1. These references therefore read on the instant application.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action

is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Audrey Y. Chang, Ph.D.
Primary Examiner
Art Unit 2872

A. Chang, Ph.D.